In the Claims:

1. (currently amended) A grinding machine including a spindle for a grinding wheel which is to grind re-entrant cams on a camshafts mounted in the grinding machine,

wherein the spindle comprises a shaft at one end of which is mounted the grinding wheel, drive means for driving the other end of the shaft, and a rigid elongate casing extending axially from the drive means and encasing the shaft, and ~~wherein~~

the drive means is an electric motor within a motor housing, ~~and~~ the shaft is carried in three hydrostatic bearings, one of which is located near said one end of the shaft so as to be at the end of the rigid casing remote from the motor, thereby to increase the shaft stiffness and increase its resistance to bending so that the length of the shaft and casing can be selected to be at least as long as the axial length of a camshaft to be ground by the wheel, the two other bearings being disposed on opposite sides of the motor, and

the casing projects to a lesser extent than the motor housing towards the location where a camshaft is mounted in use of the grinding machine to facilitate the use of a smaller diameter grinding wheel.

2. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 1 wherein the motor comprises a stator and a rotor provided within ~~a~~ the motor housing, the second bearing is located at the inner end of the part of the shaft which is external to the motor housing, and the third bearing is located within the motor housing at said other end of the shaft.

3. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 1 wherein the ~~the~~ motor comprises a stator and a rotor provided within ~~a rigid~~the motor housing which is rigid, and the non-rotating element of each of the three bearings is secured within either the rigid elongate casing or the ~~rigid~~ motor housing.

4. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 2 wherein the axial length of the part of the shaft which carries the rotor of the motor is shorter than the part of the shaft which is external to the motor housing, the shaft being constructed so that the stiffness and the support of the shorter part of the shaft

situated between the second and third bearings dictate that the first bending resonant frequency of the longer external part is above the spindle rotational frequency.

5. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 1 in which a symmetrical design of housing is employed for the motor.

6. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 5 wherein the motor housing includes a water cooling jacket in which water is forced to follow a helical path around the motor, so as to avoid cooling one side of the motor more than another.

7. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 1 the spindle is constructed to be axisymmetrical, so that any heat generated within the bearings dissipates radially into the surrounding material in a uniform manner, so that in use the spindle casing will tend to warm up and cool down uniformly, and therefore expand and contract uniformly.

8. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 1 in which, in use, oil is supplied under pressure to the bearings by a pump which draws oil from a reservoir to which oil returns from the bearings.

9. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 8 comprising an enclosure formed by the rigid casing and ~~a~~ the motor housing ~~for the motor~~, wherein oil heated in use in each bearing drains into the lower regions of the enclosure and can thereby become heated to a higher temperature then the upper regions thereof.

10. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 9 wherein the lower regions of the enclosure are formed as a separate oil collection box which is mounted to the remainder of the enclosure in such a manner that it will not impart a strain on the spindle shaft.

11. (currently amended) A ~~spindle~~ grinding machine as claimed in claim 9 wherein a thermal barrier is provided between the said lower regions and the remainder of the

enclosure to reduce the transfer of heat from the hot oil to the upper regions of the enclosure and thereby prevent thermally induced misalignment of the three bearings and any strain on the spindle shaft caused by any such misalignment.

12. (currently amended) A method of constructing a ~~spindle grinding~~ machine as claimed in claim 2 wherein during assembly the internal bores of two of the bearings are initially aligned and the third bearing is adjusted radially to bring all three bores into alignment.